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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,520	07/30/2003	Barry M. Verdegan	4191-00308	9250
26753	7590	01/13/2005		
ANDRUS, SCEALES, STARKE & SAWALL, LLP 100 EAST WISCONSIN AVENUE, SUITE 1100 MILWAUKEE, WI 53202				
			EXAMINER MATZEK, MATTHEW D	
			ART UNIT	PAPER NUMBER

1771

DATE MAILED: 01/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,520

Examiner

Matthew D. Matzek

Applicant(s)

VERDEGAN ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-78 is/are pending in the application.
- 4a) Of the above claim(s) 50-78 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-49 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/14/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-49, drawn to filter media, classified in class 442, subclass 340.
- II. Claims 50-78, drawn to a method of making filter media, classified in class 264, subclass 211.14.

The inventions are distinct, each from the other because of the following reasons:

1. Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the nanofibers of the filter media may be made via a meltblowing process. This a material different process than that of the islands-in-the-sea process disclosed in claim 51. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
2. During a telephone conversation with Michael Taken on 1/3/05 a provisional election was made with traverse to prosecute the invention of filter media, claims 1-49. Affirmation of this election must be made by applicant in replying to this Office action. Claims 50-78 withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 14-32 are hereby rejected as being dependent upon rejected claim 13.
4. It is unclear to what is meant by the term “substantially collapse” when describing the nanofibers, i.e. may the nanofibers still span the pores between the coarse fibers as they are now supported by said coarse fibers or must they align with said coarse fibers. The Examiner requests a clarification as to what is meant by the term “substantially collapse”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

5. Claims 1-4, 6, 41, and 47-48 are rejected under 35 U.S.C. 102(b) as being anticipated by Till et al. (US Patent 3,073,735).
6. Till et al. disclose a method for producing filters that comprise extremely fine fibers having a diameter from 0.5 micron to about 10 microns and other textile fibers having diameters from 10 microns and greater (col. 2, line 64 – col. 3, line 2). The fine fibers may be made of vinyl chloride and vinyl acetate copolymer (col. 6, lines 32-35) and the coarse fibers may be made from rayon (col. 6, lines 40-44).
7. Claim 41 is rejected as vinyl chloride may be burned to create phosgene.

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8. Claim 48 is rejected as the applied invention can filter moving streams of liquid or gas (col. 1, lines 39-42).

Claim Rejections - 35 USC § 102/103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 33, 35-40 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Till et al.
10. The applied patent is silent as to the triboelectric, adsorptive, surface charge, or wettability properties of the fibers and the nanofibers of the filter media. However, the claims are rejected as the prior art meets the chemical and physical limitations set forth in the independent claim upon which the rejected claims are dependent.

Claim Rejections - 35 USC § 102

11. Claims 1-8, 41, 46-48 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilson et al. (US Patent 6,155,432).
12. Wilson et al. disclose a high performance filter comprising a mixture of carbon, ceramic, glass or silica fibers and nanofibers (whiskers) (Abstract and col. 5, lines 3-6). The fibers of the applied patent are generally from about 3 microns to 20 microns and the nanofibers are from about 0.03 to about 5 microns in diameter (col. 5, lines 12-23).

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13. Claim 4 is rejected as a nanofiber diameter of 0.03 microns and a fiber diameter of 3 microns provides a ratio of coarse fiber diameter to nanofiber diameter of 100. Calculation done by Examiner.
14. The filter media of the applied patent comprises from about 5 to about 95 weight percent of inorganic fibers and from about 5 to about 95 weight percent of inorganic nanofibers (claim 6).
15. Claim 8 is rejected as Wilson et al. disclose filter with less than 1% ceramic nanofibers (col. 3, lines 30-34).
16. Claim 41 is rejected as silica may be used as a catalyst for the formation of high-density polyethylene (HDPE).
17. Claim 46 is rejected as silica is used to make flexible tubing.
18. Claim 48 is rejected as the applied patent may be used to filter liquids and gases (col. 6, lines 50-62).

Claim Rejections - 35 USC § 102/103

19. Claims 9, 33, 35-40 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Wilson et al.
20. Claim 9 is rejected as the filter media is constructed by forming a slurry comprising fibers, nanofibers, and solvent and then removing said solvent (col. 6, 20-25). The Examiner takes the position that the creation of said slurry allows for the nanofibers to be distributed uniformly throughout the filter media.
21. The applied patent is silent as to the triboelectric, adsorptive, surface charge, or wettability properties of the fibers and the nanofibers of the filter media. However, the claims

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are rejected as the prior art meets the chemical and physical limitations set forth in the independent claim upon which the rejected claims are dependent.

Claim Rejections - 35 USC § 103

22. Claims 1-7, 9-33, 35-41, and 46-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fischer (US Patent 5,800,706) in view Kahlbaugh et al. (US Patent 6,521,321).

23. Fischer et al. disclose a filter comprising nanofiber and larger diameter fibers to serve as scaffolding to hold the smaller nanofibers apart and prevent the nanofiber bed from collapsing (Abstract). The nano-fibers, tubes, fibrils of the '706 patent are carbon (col. 7, lines 50-52). The scaffold may be polymeric, inorganic, glass or metallic (col. 7, lines 40-45). The Fischer et al. filter is directed to use for both liquids and gases (Abstract).

24. Kahlbaugh et al. teach a filter, comprising fine and coarse fibers (Abstract). The fine fibers have diameters typically about 0.1 to 3 microns and the coarse fibers have diameters of at least 10 microns (col. 8, lines 9-11 and col. 12, lines 7-9). The fine fibers may be made of glass, polypropylene, PVC, and polyamides (col. 17, lines 15-19). The fine fibers can be secured to the coarse fiber support (col. 17, lines 32-35). The invention of Kahlbaugh et al. is used to filter fluid streams (col. 1, lines 18-30).

25. It would have obvious to one of ordinary skill in the art to have made the invention of Fischer et al. with the fine fibers used by Kahlbaugh et al. motivated by the successful creation of a fluid filter and allow the fine fibers to be secured to the coarse fiber support according to Kahlbaugh et al.

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26. Claim 4 is rejected as a nanofiber diameter of 0.1 microns and a coarse fiber diameter of 10 microns provides a ratio of coarse fiber diameter to nanofiber diameter of 100. Calculation done by Examiner.

27. The invention of the '706 patent may contain from 1 to 99 weight percent nanofibers and from 1 to 99 weight percent scaffold fibers (col. 10, lines 1-8).

28. Claim 9 is rejected because according to one embodiment of the Fischer invention the distribution of the scaffolding fibers and nanofibers is uniform (col. 1, lines 8-12).

29. Claim 10 is rejected because according to one embodiment of the Fischer invention the distribution of the scaffolding fibers and nanofibers is not uniform (col. 9, lines 30-33). The nanofibers may congregate and form bundles or web-like domains (col. 9, lines 35-36).

30. Claim 11 is rejected as the Examiner takes the position that as the composition of the filter media may contain 1-99 weight percent scaffold fiber and 1-99 weight percent nanofiber and as the nanofibers meet the diameter limitation set forth in independent claim from which claim 11 is dependent the nanofibers "are provided in low enough concentration and small enough diameter that there is insubstantial difference in flow velocity, relative to media without nanofibers, through said media across a face thereof until said nanofiber bundles begin to plug..." (Applicant claim 11).

31. The packing of the nanofibers within the filter media may be non-uniform (col. 9, line 38). A thin layer of nanofibers may be formed on the top (upstream) or bottom (downstream) portions or within the filter (col. 9, lines 40-45). The Examiner takes the position that within the thin layer of nanofibers there would be one set of nanofibers extending parallel to one face of the filter and one set of nanofibers extending normal to one face of the filter as the nanofibers are

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randomly oriented within the thin layer (col. 8, lines 56-60). Claims 12 and 28 are hereby rejected.

32. Claims 13-24, 29-30, 32 are rejected as the invention of Fischer relates to nanofibers, which are either uniformly or non-uniformly blended with supporting scaffold particulates to form packed beds (col. 1, lines 10-13). The nanofibers may cling to or span the supporting scaffold fibers (col. 8, lines 26-27). The nanofibers may also congregate at the top (upstream) or bottom (downstream) portions or within the filter forming regions with high concentrations (bundles) of nanofibers away from said scaffolding fibers (col. 9, lines 38-45).

33. The dimension of the bundles in the Fischer patent have not been measured, however as the prior art meets the chemical and physical limitations set forth in the claims from which Applicant claims 25 and 26 are dependent, claims 25 and 26 are hereby rejected.

34. Claim 27 is rejected as the volume percentage of nanofibers in patent '706 may be between 1 and 99 percent therefore the nanofiber bundles of "Macrostructure B" would cumulatively occupy less than 20% of the volume of said filter media (col. 10, lines 1-5).

35. Claims 31 and 41 are rejected as polyamide is used as a catalyst made by Ferro®.

36. Claims 33, and 35-40 are rejected as the applied patent is silent as to the triboelectric, adsorptive, surface charge, or wettability properties of the fibers and the nanofibers of the filter media. However, the claims are rejected as the prior art meets the chemical and physical limitations set forth in the independent claim upon which the rejected claims are dependent.

37. Claim 46 is rejected as PVC is used to make flexible tubing.

Claim Rejections - 35 USC § 102/103

38. Claims 1-6, 13, 20, 29, 31-49 are rejected under 35 U.S.C. 102(e) as being anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Kahlbaugh et al.

39. Kahlbaugh et al. teach a filter, comprising fine and coarse fibers (Abstract). The fine fibers have diameters typically about 0.1 to 3 microns and the coarse fibers have diameters of at least 10 microns (col. 8, lines 9-11 and col. 12, lines 7-9). The fine fibers may be made of glass, or polymers such as polypropylene, PVC, and polyamides (col. 17, lines 15-19). The filter media comprises multiple layers and the fine fiber web may be bonded to the surface of a coarse fiber support (col. 17, lines 30-35). It is disclosed that in some instances the engineer will desire to have all the layers of the filter comprise the same material, however in other instances different materials may be used in some or all of the layers (col. 25, lines 9-12).

40. Claim 4 is rejected as a nanofiber diameter of 0.1 microns and a coarse fiber diameter of 10 microns provides a ratio of coarse fiber diameter to nanofiber diameter of 100. Calculation done by Examiner.

41. The applied patent discloses an invention comprising fine and coarse fibers that are not mixed together or entangled, rather substrates positioned upon other substrates (col. 12, lines 20-35). This demonstrates that the nanofibers are concentrated at one of the faces of the filter. At the interface of said substrates the nanofibers extend across the framework of the coarse material (col. 14, lines 60-62). This embodiment corresponds to Applicant's macrostructure C and microstructure 1. As such, claims 13, 20, and 29 are rejected.

42. Claims 33, and 35-40 are rejected as the applied patent is silent as to the triboelectric, adsorptive, surface charge, or wettability properties of the fibers and the nanofibers of the filter

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media. However, the claims are rejected as the prior art meets the chemical and physical limitations set forth in the independent claim upon which the rejected claims are dependent.

43. The applied patent discloses the use of coarse cellulosic fibers and fine polymeric fibers, which includes acrylic, polyester, and polypropylene fibers rejecting claim 34 (col. 11, lines 55-63).

44. Claims 31 and 41 are rejected as polyamide is used as a catalyst made by Ferro®.

45. The applied patent teaches filter media comprising a plurality of fibrous layers for filtration including more than one layer of fine fibers (col. 6, lines 20-24). While the applied patent states that the diameter of the fine fibers are “typically” about 0.1 to 3 microns, Wilson et al. has shown that glass nanofibers may have diameters as small as 0.03 microns. As the diameters of the fine fibers of the applied patent are included in both the first and second sets of fiber diameter in Applicant claim 42 and its coarse fiber diameter requirement is also met prior art claim 42 is rejected. A preferred filter media construction comprises a coarse fibrous layer with fiber diameter at least 10 microns, adjacent to a layer of fibers with diameters of no greater than about 5 microns, adjacent to a layer of fine fibers with diameters of less than one micron meeting the trimodal distribution of Applicant claim 42 (col. 8, lines 5-20).

46. Claim 45 is rejected as the fine fibers may be polymeric and the coarse fibers may be polymeric or cellulosic in nature (col. 11, lines 55-63 and col. 17, lines 15-19).

47. Claim 46 is rejected as PVC is used to make flexible tubing.

48. The filter media of the applied patent may be used to filter gases or liquids (col. 7, lines 11-16).

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Conclusion

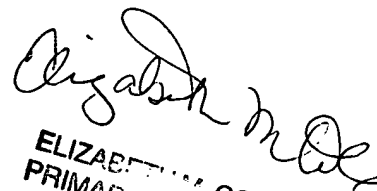
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew D. Matzek whose telephone number is (571) 272-2423.

The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

mdm


ELIZABETH COLE
PRIMARY EXAMINER